



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
15.05.2013 Bulletin 2013/20

(51) Int Cl.:
H04W 84/20 (2009.01)

(43) Date of publication A2:
27.10.2010 Bulletin 2010/43

(21) Application number: **10160960.0**

(22) Date of filing: **23.04.2010**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA ME RS

(30) Priority: **24.04.2009 US 429358**

(71) Applicant: **Digi International Inc.**
Minnetonka, MN 55343 (US)

(72) Inventors:
• **Byard, Robert P.**
Sandy, UT 84093 (US)
• **George, J Douglas**
Orem, UT 84057 (US)
• **Filoso, John P.**
Pleasant Grove, UT 84062 (US)

(74) Representative: **Curley, Donnacha John et al**
Hanna Moore & Curley
13 Lower Lad Lane
Dublin 2 (IE)

(54) **Method for synchronizing sleeping nodes in a wireless network**

(57) A system and method of operating a wireless network having a plurality of nodes. Each node determines whether to replace the beacon node. When a node determines that the beacon node is to be replaced, the node determines whether it should nominate itself as a potential replacement beacon node. The decision whether to nominate itself as a potential replacement beacon node is a function of a random number generated by the node. If the node determines that it should nominate itself as a potential replacement beacon node, the node sends out one or more beacon signals. Beacon signals are received by potential replacement nodes and, if the potential replacement beacon node has received a beacon signal from a higher ranking potential replacement beacon node, the node removes itself as a candidate for the replacement beacon node.

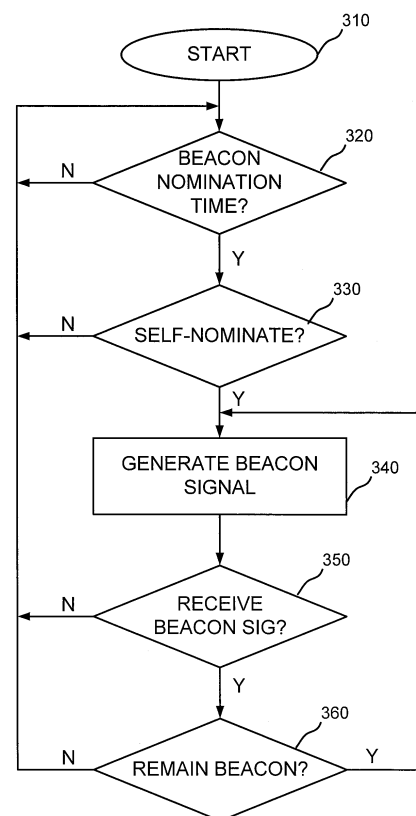


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 0960

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 7 461 130 B1 (ABDELAZIZ MOHAMED M [US] ET AL) 2 December 2008 (2008-12-02) * column 1, lines 9-47 * * column 2, lines 37-67 * * column 3, lines 1-9 * * page 4, lines 30-67 * * column 5, lines 1-15,50-67 * * column 6, lines 16-26,65-67 * * column 7, lines 1-17,64-67 * * column 8, lines 1-21,30-51 * * column 10, lines 9-21,52-62 *	1-17	INV. H04W84/20
Y	US 2007/127421 A1 (D AMICO THOMAS V [US] ET AL) 7 June 2007 (2007-06-07) * abstract * * paragraphs [0001], [0004], [0026], [0041], [0043] - [0055], [0078], [0081], [0084], [0088], [0089] *	1-17	
Y	US 2006/014536 A1 (DEMIRHAN MUSTAFA [US] ET AL) 19 January 2006 (2006-01-19) * paragraphs [0037] - [0041] *	1-17	TECHNICAL FIELDS SEARCHED (IPC)
A	WO 2008/116196 A1 (QUALCOMM INC [US]; DHARMARAJU DINESH [US]; NANDAGOPALAN SAISHANKAR [US]) 25 September 2008 (2008-09-25) * the whole document *	1-17	H04J H04W
A	EP 1 487 155 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 15 December 2004 (2004-12-15) * the whole document *	1-17	
A	EP 1 458 141 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 15 September 2004 (2004-09-15) * the whole document *	1-17	
		-/--	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 April 2013	Examiner Manuel, Grégory
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 0960

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 465 362 A2 (SHARP KK [JP]) 6 October 2004 (2004-10-06) * the whole document *	1-17	
A	US 6 732 189 B1 (NOVAES MARCOS N [US]) 4 May 2004 (2004-05-04) * the whole document *	1-17	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 April 2013	Examiner Manuel, Grégory
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 16 0960

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-04-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 7461130	B1	02-12-2008	NONE	
US 2007127421	A1	07-06-2007	NONE	
US 2006014536	A1	19-01-2006	CN 101015172 A	08-08-2007
			DE 112005001667 T5	16-05-2007
			GB 2430841 A	04-04-2007
			MY 141340 A	16-04-2010
			TW 1326170 B	11-06-2010
			US 2006014536 A1	19-01-2006
			WO 2006019618 A1	23-02-2006
WO 2008116196	A1	25-09-2008	CN 101641916 A	03-02-2010
			EP 2137896 A1	30-12-2009
			JP 2010522519 A	01-07-2010
			KR 20090132619 A	30-12-2009
			TW 200904070 A	16-01-2009
			US 2008232393 A1	25-09-2008
			WO 2008116196 A1	25-09-2008
EP 1487155	A2	15-12-2004	EP 1487155 A2	15-12-2004
			JP 2005006327 A	06-01-2005
			KR 20040107833 A	23-12-2004
			US 2004255001 A1	16-12-2004
EP 1458141	A2	15-09-2004	CN 1531239 A	22-09-2004
			EP 1458141 A2	15-09-2004
			JP 2004282758 A	07-10-2004
			KR 20040080770 A	20-09-2004
			US 2004179488 A1	16-09-2004
EP 1465362	A2	06-10-2004	EP 1465362 A2	06-10-2004
			JP 4080366 B2	23-04-2008
			JP 2004312060 A	04-11-2004
			US 2004196872 A1	07-10-2004
US 6732189	B1	04-05-2004	NONE	